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# North Dakota Agriculture Processing

## *Content Standards*

Approved and Adopted  
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North Dakota Department of Career and Technical Education

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The North Dakota State Board for Career and Technical Education has reviewed this standards document, approved the content, and officially adopted the material until 2010.

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## North Dakota Agriculture Processing Standards

### Introduction

The North Dakota Department of Career and Technical Education is committed to working on standards to ensure that each program area can offer courses that allow students to acquire knowledge and skills. CTE not only provides technical skills and knowledge for students to succeed in careers, but also cross-functional workplace skills such as teamwork, problem solving, and the ability to find and use information, and provides the context in which traditional educational goals and academic skills can be enhanced.

The standards process is one that directly involves the state supervisor(s), the curriculum administrator for this agency, and teachers working directly with the content at hand. Once the standards are written and expectations are clearly defined, the standards are then compared and aligned with national and industry standards.

The Department of Career and Technical Education strongly believes in the importance of academic integration within each program area. The standards produced for each program area will be cross walked with the most current academic drafts of English Language Arts, Mathematics, and Science. When possible, standards will be cross walked with other academic areas that correspond.

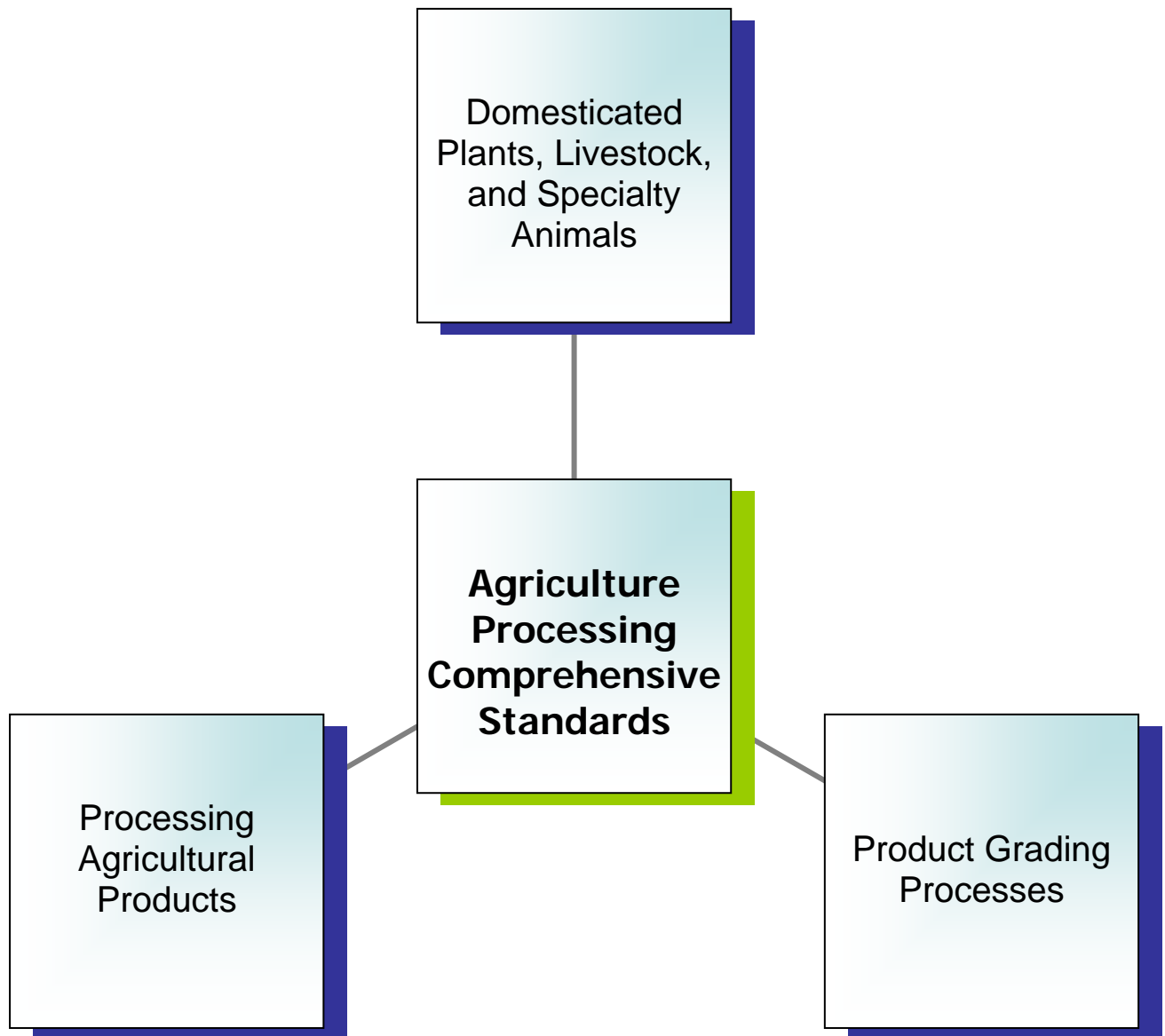
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### Definitions

For each standard, there is one or more topic statements along with competencies for each topic. The competencies are categorized into three divisions: Introductory, Core, and Advanced. These divisions can further be defined as:

Introductory:	Knowledge Acquisition—Learners at this level expand awareness and build comprehension of knowledge.
Core:	Application—Learners at this level experience acquired knowledge by applying it to situations and self.
Advanced:	Reflection—Learners at this level analyze, synthesize, judge, assess, and evaluate knowledge in accord with their own goals, values, and beliefs, and/or real situations.

## Overview of Standards



## Standards at a Glance

### COMPREHENSIVE STANDARDS

#### 1.0 DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS

- Understand the uses of domesticated plants, livestock, and specialty animals in society.

#### 2.0 PROCESSING AGRICULTURAL PRODUCTS

- Understand safety, processing, servicing, and retail marketing in agriculture.

#### 3.0 PRODUCT GRADING PROCESSES

- Understand the grading process of different agricultural products.

## **Standards with Topics**

### **CONTENT STANDARDS**

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#### **1.0 DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS**

- Understand the uses of domesticated plants, livestock, and specialty animals in society.
    - 1.1 Understand products and by-products of domesticated plants.
    - 1.2 Understand products and by-products of domesticated livestock.
    - 1.3 Understand products and by-products of specialty crops and animals.
    - 1.4 Explore career opportunities in agriculture processing.
- 

#### **2.0 PROCESSING AGRICULTURAL PRODUCTS**

- Understand safety, processing, servicing, and retail marketing in agriculture.
    - 2.1 Understand basic processing procedures and methods for animals.
    - 2.2 Understand basic processing procedures and methods for plants and crops.
    - 2.3 Understand packaging and labeling requirements of agricultural products.
    - 2.4 Understand operation, service and maintenance of processing equipment.
    - 2.5 Understand food safety and sanitation standards for processing agriculture products.
- 

#### **3.0 PRODUCT GRADING PROCESSES**

- Understand the grading process of different agricultural products.
    - 3.1 Understand USDA grades and grading process for animals, crops, and other agriculture products.
-





Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

Topic 1: Understand products and by-products of domesticated plants.

### *Student Competencies*

#### Introductory

1.1.1 List commodities produced from ND crops.

#### Core

1.1.2 Identify retail and wholesale products from ND raised plants.

#### Advanced

1.1.3 Map the marketing chain of various ND agricultural products, i.e. producer to consumer.

### *Keys to Employability*

#### Basic Skills

1. Reading→ Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
2. Writing→ Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
3. Arithmetic/Mathematics→ Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.
4. Listening→ Receives, attends to, interprets, and responds to verbal messages and other cues.
5. Speaking→ Organizes ideas and communicates orally.

#### Thinking Skills

1. Creative Thinking→ Generates new ideas.
2. Decision Making→ Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
3. Problem Solving→ Recognizes problems and devises and implements plan of action.
4. Seeing Things in the Mind's Eye→ Organizes, processes symbols, pictures, graphs, objects, and other information.
5. Knowing How to Learn→ Uses efficient learning techniques to acquire and apply new knowledge and skills.
6. Reasoning→ Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

Topic 2: Understand products and by-products of domesticated livestock.

### *Student Competencies*

#### Introductory

1.2.1 List commodities produced from ND livestock.

#### Core

1.2.2 Identify retail and wholesale products from animal agriculture (e.g. beef, dairy, sheep, pork, poultry, etc.).

#### Advanced

1.2.3 Map the marketing chain of various ND agricultural products, i.e. producer to consumer.

### *Keys to Employability*

#### Personal Qualities

1. Responsibility→ Exerts a high level of effort and perseveres towards goal attainment.
2. Self-Esteem→ Believes in own self worth and maintains a positive view of self.
3. Sociability→ Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group setting.
4. Self-Management→ Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.
5. Integrity/Honesty→ Chooses ethical courses of action.

#### Resources

1. Time→ Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.
2. Money→ Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.
3. Material and Facilities→ Acquires, stores, allocates, and uses materials or space efficiently.
4. Human Resources→ Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

Topic 3: Understand products and by-products of specialty crops and animals.

### *Student Competencies*

#### Introductory

- 1.3.1 List commodities produced from ND specialty plants and animals.

#### Core

- 1.3.2 Identify ND specialty products and their uses (e.g. honey, hemp, omega flax).

#### Advanced

- 1.3.3 Map the marketing chain of various ND agricultural products, i.e. producer to consumer.

### *Keys to Employability*

#### Interpersonal

1. Participates as a Member of a Team→ Contributes to group effort.
2. Teaches Others New Skills.
3. Serves Clients/Customers→ Works to satisfy customers' expectations.
4. Exercises Leadership→ Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
5. Negotiates→ Works toward agreements involving exchange of resources; resolves divergent interests.
6. Works with Diversity→ Works well with men and women from diverse backgrounds.

#### Information

1. Acquires and Evaluates Information.
2. Organizes and Maintains Information.
3. Interprets and Communicates Information.
4. Uses Computers to Process Information.

Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

Topic 4: Explore career opportunities in agriculture processing.

### *Student Competencies*

#### Introductory

1.4.1 Explore careers available in agricultural processing.

#### Core

1.4.2 Link SAE areas to agriculture processing.

1.4.3 Research professions in the field of agriculture processing (e.g. interview professionals, skill required).

#### Advanced

1.4.4 Encourage the establishment of SAE's in agriculture processing.

### *Keys to Employability*

#### Systems

1. Understands Systems→ Knows how social, organizational, and technological systems work and operates effectively with them.
2. Monitors and Corrects Performance→ Distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions.
3. Improves or Designs Systems→ Suggests modifications to existing systems and develops new or alternative systems to improve performance.

#### Technology

1. Selects Technology→ Chooses procedures, tools, or equipment including computers and related technologies.
2. Applies Technology to Task→ Understands overall intent and proper procedures for setup and operation of equipment.
3. Maintains and Troubleshoots Equipment→ Prevents, identifies, or solves problems with equipment, including computers and other technologies.

Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

## Academic Cross Walk

### English Language Arts

- 9.1.3 Cross-reference information
- 9.1.5 Organize information from a variety of sources
- 9.1.7 Identify and avoid plagiarism
- 10.1.1 Form questions to focus research
- 10.1.2 Know ways to effectively search electronic databases
- 10.1.5 Organize information from a variety of sources into a unified whole
- 10.1.7 Paraphrase information
- 11.1.1 Research topics independently using appropriate sources
- 11.1.2 Evaluate and incorporate information from primary sources
- 11.1.4 Verify the quality, accuracy, and usefulness of information
- 9.3.8 Use supporting details
- 9.3.10 Edit and revise compositions for proper mechanics and grammar, syntax, diction, and order
- 9.3.11 Arrange paragraphs in a logical progression
- 9.3.12 Use technology to present written work
- 10.3.7 Use a variety of supporting details
- 10.3.10 Use a specific point of view in compositions
- 11.3.5 Use a variety of supporting details
- 11.3.8 Incorporate visual aids into written work to enhance meaning
- 12.3.4 Use variety of sources for supporting details
- 12.3.5 Elaborate ideas through word choice and description using grade-level vocabulary
- 10.5.2 Use media for a variety of purposes

### Library/Technology Literacy

- 12.1.1 Define a research problem or task
- 12.1.2 Plan a research strategy
- 12.1.3 Access information using a variety of sources
- 12.1.4 Use a variety of criteria to evaluate and select information for research
- 12.1.5 Use organizational strategies to record and synthesize information
- 12.1.6 Present research
- 12.1.7 Evaluate the research process
- 12.2.1 Demonstrate awareness of audience when creating media products
- 12.2.2 Synthesize information to create a product that meets a specific need
- 12.2.3 Use a variety of criteria to evaluate media products
- 12.2.4 Use a variety of media and technology to communicate with communities beyond the school
- 12.3.1 Explain and use appropriate terminology and concepts associated with media and technology
- 12.3.2 Apply strategies for identifying and solving routine hardware and software problems
- 12.3.3 Explain features and uses of current and emerging media and technology
- 12.3.4 Explain ways in which social and economic forces influence which technologies will be developed and used
- 12.4.1 Work cooperatively and collaboratively when using media and technology
- 12.4.2 Develop competence and selectivity in reading, listening, and viewing
- 12.4.3 Demonstrate self-motivation in seeking information
- 12.4.4 Use a variety of media and technology for personal needs and enjoyment
- 12.5.1 Follow school policies for responsible use of information resources
- 12.5.2 Demonstrate proper form of citations and bibliographies
- 12.5.3 Understand and obey intellectual property laws, including copyright, when using information in any format
- 12.5.4 Understand the impact of equitable access to information in a democracy

Standard 1: DOMESTICATED PLANTS, LIVESTOCK, AND SPECIALTY ANIMALS – Understand the uses of domesticated plants, livestock, and specialty animals in society.

## Academic Cross Walk

### Mathematics

None listed.

### Science

- 9-10.1.1 Understand the interaction of components within a system
- 9-10.1.4 Know how classification can be based on the relationship between form and function
- 9-10.1.6 Explain how models can be used to illustrate scientific principles
- 11-12.1.1 Understand the structure, organization, and dynamics of components within a system
- 9-10.2.7 Analyze data found in tables, charts, and graphs to formulate conclusions
- 9-10.8.3 Understand the role of scientists in theoretical and applied science

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

Topic 1: Understand basic processing procedures and methods for animals.

### *Student Competencies*

#### Introductory

- 2.1.1 Distinguish the procedures of animal processing.
- 2.1.2 Explain the safe handling of meat and dairy products.
- 2.1.3 Label skeletal and muscular anatomy of carcasses.

#### Core

- 2.1.4 List steps for fabrication of meat animals. (e.g. beef, pork, lamb or deer carcass).
- 2.1.5 Identify retail cuts of meat products by species.
- 2.1.6 Identify retail dairy products.
- 2.1.7 Calculate meat formulation problems.

#### Advanced

- 2.1.8 Fabricate meat animal carcasses into wholesale retail cuts and processed products (e.g. beef, pork, lamb or deer carcass).
- 2.1.9 Fabricate a processed dairy product (e.g. butter, yogurt, cheese, etc.).

### *Keys to Employability*

#### Basic Skills

- 1. Reading→ Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- 2. Writing→ Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
- 3. Arithmetic/Mathematics→ Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.
- 4. Listening→ Receives, attends to, interprets, and responds to verbal messages and other cues.
- 5. Speaking→ Organizes ideas and communicates orally.

#### Thinking Skills

- 1. Creative Thinking→ Generates new ideas.
- 2. Decision Making→ Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
- 3. Problem Solving→ Recognizes problems and devises and implements plan of action.
- 4. Seeing Things in the Mind's Eye→ Organizes, processes symbols, pictures, graphs, objects, and other information.
- 5. Knowing How to Learn→ Uses efficient learning techniques to acquire and apply new knowledge and skills.
- 6. Reasoning→ Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.



Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

Topic 2: Understand basic processing procedures and methods for plants and crops.

### *Student Competencies*

#### Introductory

- 2.2.1 Distinguish the procedures of plant product processing.

#### Core

- 2.2.2 Describe the processing of grain, honey, fruit, vegetables and other specialty plants/crops in ND.

#### Advanced

- 2.2.3 Describe the blending process to meet industry requirement standards.

### *Keys to Employability*

#### Personal Qualities

1. Responsibility→ Exerts a high level of effort and perseveres towards goal attainment.
2. Self-Esteem→ Believes in own self worth and maintains a positive view of self.
3. Sociability→ Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group setting.
4. Self-Management→ Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.
5. Integrity/Honesty→ Chooses ethical courses of action.

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

Topic 3: Understand packaging and labeling requirements of agricultural products.

### *Student Competencies*

#### Introductory

- 2.3.1 List the basic components of a food label. (e.g. ingredients, nutrition, serving size, etc.).

#### Core

- 2.3.2 Design a food product label.  
2.3.3 Calculate grading problems for animals and crops.  
2.3.4 Determine retail pricing.

#### Advanced

- 2.3.5 Develop a nutrition label. (e.g. calculate nutrition levels, serving size, etc.).  
2.3.6 Design a marketing package.

### *Keys to Employability*

#### Resources

1. Time→ Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.
2. Money→ Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.
3. Material and Facilities→ Acquires, stores, allocates, and uses materials or space efficiently.
4. Human Resources→ Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

Topic 4: Understand operation, service and maintenance of processing equipment.

### *Student Competencies*

#### Introductory

2.4.1 Identify processing equipment.

#### Core

2.4.2 Exhibit safe operation, sanitation and maintenance, of food processing equipment.

#### Advanced

2.4.3 Display skills necessary to assemble, disassemble, and maintain processing equipment.

### *Keys to Employability*

#### Interpersonal

1. Participates as a Member of a Team→ Contributes to group effort.
2. Teaches Others New Skills.
3. Serves Clients/Customers→ Works to satisfy customers' expectations.
4. Exercises Leadership→ Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
5. Negotiates→ Works toward agreements involving exchange of resources; resolves divergent interests.
6. Works with Diversity→ Works well with men and women from diverse backgrounds.

#### Information

1. Acquires and Evaluates Information.
2. Organizes and Maintains Information.
3. Interprets and Communicates Information.
4. Uses Computers to Process Information.

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

Topic 5: Understand food safety and sanitation standards for processing agriculture products.

### *Student Competencies*

#### Introductory

- 2.5.1 Understand the importance of sanitation and food safety in processing agricultural products.
- 2.5.2 Identify food safety rules and regulations (e.g. HACCP, FDA, USDA, etc.).

#### Core

- 2.5.3 List time and temperature standards for safe storage of products.
- 2.5.4 Identify sanitation products used in cleaning processing equipment.
- 2.5.5 List requirements for bacterial growth and how to prevent it.

#### Advanced

- 2.5.6 Describe the effects of sugar, yeast, cultures, pH, etc. on food products.

### *Keys to Employability*

#### Systems

- 1. Understands Systems→ Knows how social, organizational, and technological systems work and operates effectively with them.
- 2. Monitors and Corrects Performance→ Distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions.
- 3. Improves or Designs Systems→ Suggests modifications to existing systems and develops new or alternative systems to improve performance.

#### Technology

- 1. Selects Technology→ Chooses procedures, tools, or equipment including computers and related technologies.
- 2. Applies Technology to Task→ Understands overall intent and proper procedures for setup and operation of equipment.
- 3. Maintains and Troubleshoots Equipment→ Prevents, identifies, or solves problems with equipment, including computers and other technologies.

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

## Academic Cross Walk

### English Language Arts

- 9.1.1 Choose a broad topic, state the problem, or question
- 9.1.3 Cross-reference information
- 9.1.4 Evaluate relevancy of information
- 9.1.5 Organize information from a variety of sources
- 9.1.6 Summarize information
- 9.1.7 Identify and avoid plagiarism
- 9.1.9 Use graphic organizer
- 10.1.1 Form questions to focus research
- 10.1.2 Know ways to effectively search electronic databases
- 10.1.3 Gather reliable information to support a thesis
- 10.1.4 Use relevant information
- 10.1.5 Organize information from a variety of sources into a unified whole
- 10.1.7 Paraphrase information
- 10.1.10 Write a research paper
- 10.1.11 Present research information
- 11.1.1 Research topics independently using appropriate sources
- 11.1.2 Evaluate and incorporate information from primary sources
- 11.1.4 Verify the quality, accuracy, and usefulness of information
- 11.1.5 Synthesize information in a logical sequence
- 12.1.1 Plan a research strategy
- 12.1.3 Develop a research question
- 12.1.4 Defend research paper or project
- 9.2.6 Demonstrate oral reading fluency
- 9.2.7 Access prior knowledge to interpret meaning
- 9.2.12 Explain ways in which the setting affects the development of a story
- 10.2.7 Apply universal themes to real life situations
- 11.2.6 Apply prior knowledge of content to interpret meaning of text
- 12.2.8 Use technical language/jargon to decipher meaning
- 9.3.3 Develop a composition detailing an opinion
- 9.3.5 Organize the ideas and details of a composition according to purpose
- 9.3.8 Use supporting details
- 9.3.11 Arrange paragraphs in a logical progression
- 9.3.12 Use technology to present written work
- 10.3.2 Defend a personal opinion using facts as support
- 10.3.4 Organize the ideas and details of a composition according to purpose
- 10.3.7 Use a variety of supporting details
- 10.3.10 Use a specific point of view in compositions

### English Language Arts (cont.)

- 11.3.2 Organize the ideas and details of a composition according to purpose
- 11.3.3 Elaborate ideas through word choice and description using grade-level vocabulary
- 11.3.5 Use a variety of supporting details
- 11.3.8 Incorporate visual aids into written work to enhance meaning
- 12.3.4 Use variety of sources for supporting details
- 12.3.5 Elaborate ideas through word choice and description using grade-level vocabulary
- 9.6.3 Use conventions of punctuation

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

## Academic Cross Walk

### Library/Technology Literacy

- 12.1.1 Define a research problem or task
- 12.1.2 Plan a research strategy
- 12.1.3 Access information using a variety of sources
- 12.1.4 Use a variety of criteria to evaluate and select information for research
- 12.1.5 Use organizational strategies to record and synthesize information
- 12.1.6 Present research
- 12.1.7 Evaluate the research process.
- 12.2.1 Demonstrate awareness of audience when creating media products
- 12.2.2 Synthesize information to create a product that meets a specific need
- 12.2.3 Use a variety of criteria to evaluate media products
- 12.2.4 Use a variety of media and technology to communicate with communities beyond the school
- 12.3.1 Explain and use appropriate terminology and concepts associated with media and technology
- 12.3.2 Apply strategies for identifying and solving routine hardware and software problems
- 12.3.3 Explain features and uses of current and emerging media and technology
- 12.3.4 Explain ways in which social and economic forces influence which technologies will be developed and used
- 12.4.1 Work cooperatively and collaboratively when using media and technology
- 12.4.2 Develop competence and selectivity in reading, listening, and viewing
- 12.4.3 Demonstrate self-motivation in seeking information
- 12.4.4 Use a variety of media and technology for personal needs and enjoyment
- 12.5.1 Follow school policies for responsible use of information resources
- 12.5.2 Demonstrate proper form of citations and bibliographies
- 12.5.3 Understand and obey intellectual property laws, including copyright, when using information in any format
- 12.5.4 Understand the impact of equitable access to information in a democracy

### Mathematics

- 9-10.1.1 Express numbers between one-billionth and one billion in fraction, decimal, and verbal form; express numbers of all magnitudes in scientific notation
- 9-10.1.8 Apply estimation skills to predict realistic solutions to problems
- 9-10.1.9 Select and use a computational technique to solve problems involving real numbers
- 9-10.1.10 Explain the reasonableness of a problem's solution and the process used to obtain it
- 11-12.1.7 Add, subtract, and multiply complex numbers
- 9-10.3.1 Construct appropriate displays of given data
- 9-10.3.2 Interpret a given visual representation of a set of data
- 9-10.3.6 Calculate probabilities of compound events using addition and multiplication rules
- 11-12.3.1 Choose, construct, and interpret a display to represent a set of data
- 9-10.4.1 Select appropriate units and scales for problem situations involving measurement
- 9-10.4.3 Use approximations to compare the standard and metric systems of measurement
- 9-10.4.4 Given a conversion factor, convert between standard and metric measurements
- 9-10.4.5 Use methods necessary to achieve a specified degree of precision and accuracy in measurement situations
- 9-10.4.6 Employ estimation techniques to evaluate reasonableness of results in measurement situations
- 9-10.5.4 Perform the operations of addition, subtraction, multiplication, and division on algebraic functions
- 9-10.5.10 Solve a literal equation for a specified variable
- 9-10.5.11 Use essential quantitative relationships in a situation to determine whether the relationship can be modeled by a linear function
- 9-10.5.14 Draw conclusions about a situation being modeled

Standard 2: PROCESSING AGRICULTURAL PRODUCTS – Understand safety, processing, servicing, and retail marketing in agriculture.

## Academic Cross Walk

### Science

- |            |                                                                                                                    |
|------------|--------------------------------------------------------------------------------------------------------------------|
| 11-12.1.1  | Understand the structure, organization, and dynamics of components within a system                                 |
| 9-10.2.2   | Identify questions and concepts that guide scientific Investigations                                               |
| 9-10.2.3   | Formulate a testable hypothesis for a simple investigation                                                         |
| 9-10.2.5   | Design and conduct a guided investigation                                                                          |
| 9-10.2.6   | Maintain clear and accurate records of scientific Investigations                                                   |
| 9-10.2.7   | Analyze data found in tables, charts, and graphs to formulate conclusions                                          |
| 11-12.2.1  | Use appropriate safety equipment and precautions during investigations                                             |
| 11-12.2.2  | Select and use appropriate instruments, measuring tools, and units of measure to improve scientific investigations |
| 11-12.2.3  | Use data from scientific investigations in order to accept or reject a hypothesis                                  |
| 11-12.2.4  | Formulate and revise explanations based upon scientific knowledge and experimental data                            |
| 11-12.2.7  | Design and conduct an independent investigation                                                                    |
| 11-12.2.5  | Use technology and mathematics to improve investigations and communications                                        |
| 11-12.2.8  | Communicate and defend a scientific argument                                                                       |
| 11-12.3.12 | Understand the relationship between thermal energy, temperature, and the motion of particles                       |
| 11-12.3.14 | Understand how energy is related to physical changes of matter                                                     |
| 9-10.4.2   | Relate the functions of cells in multicellular organisms to their cell type                                        |
| 9-10.4.3   | Know the relationship between protein structure and function                                                       |
| 9-10.7.1   | Understand how personal health is related to fitness, substance abuse, sexual activity, and nutrition              |



Standard 3: PRODUCT GRADING PROCESSES – Understand the grading process of different agricultural products.

Topic 1: Understand USDA grades and grading process for animals, crops, and other agriculture products.

### *Student Competencies*

#### Introductory

- 3.1.1 List USDA Grades of various agricultural products (e.g. meat, dairy, eggs, grain etc.).

#### Core

- 3.1.2 Determine USDA grades for agricultural products.  
3.1.3 Understand quality grading processes.

#### Advanced

- 3.1.4 Affect of feeding programs on quality grades of livestock carcasses.  
3.1.5 Understand the Total Quality Management (TQM) program.

### *Keys to Employability*

#### Basic Skills

1. Reading→ Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
2. Writing→ Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
3. Arithmetic/Mathematics→ Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.
4. Listening→ Receives, attends to, interprets, and responds to verbal messages and other cues.
5. Speaking→ Organizes ideas and communicates orally.

#### Thinking Skills

1. Creative Thinking→ Generates new ideas.
2. Decision Making→ Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
3. Problem Solving→ Recognizes problems and devises and implements plan of action.
4. Seeing Things in the Mind's Eye→ Organizes, processes symbols, pictures, graphs, objects, and other information.
5. Knowing How to Learn→ Uses efficient learning techniques to acquire and apply new knowledge and skills.
6. Reasoning→ Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

#### Information

1. Acquires and Evaluates Information.
2. Organizes and Maintains Information.
3. Interprets and Communicates Information.
4. Uses Computers to Process Information.





Standard 3: PRODUCT GRADING PROCESSES – Understand the grading process of different agricultural products.

## Academic Cross Walk

### English Language Arts

- 9.1.1 Choose a broad topic, state the problem, or question
- 9.1.3 Cross-reference information
- 9.1.4 Evaluate relevancy of information
- 9.1.5 Organize information from a variety of sources
- 9.1.6 Summarize information
- 9.1.7 Identify and avoid plagiarism
- 9.1.9 Use graphic organizer
- 10.1.1 Form questions to focus research
- 10.1.2 Know ways to effectively search electronic databases
- 10.1.3 Gather reliable information to support a thesis
- 10.1.4 Use relevant information
- 10.1.5 Organize information from a variety of sources into a unified whole
- 10.1.7 Paraphrase information
- 10.1.10 Write a research paper
- 10.1.11 Present research information
- 11.1.1 Research topics independently using appropriate sources
- 11.1.2 Evaluate and incorporate information from primary sources
- 11.1.4 Verify the quality, accuracy, and usefulness of information
- 11.1.5 Synthesize information in a logical sequence
- 12.1.3 Develop a research question
- 12.1.1 Plan a research strategy
- 12.1.4 Defend research paper or project
- 9.2.6 Demonstrate oral reading fluency
- 9.2.7 Access prior knowledge to interpret meaning
- 9.2.12 Explain ways in which the setting affects the development of a story
- 10.2.7 Apply universal themes to real life situations
- 11.2.6 Apply prior knowledge of content to interpret meaning of text
- 12.2.8 Use technical language/jargon to decipher meaning
- 9.3.3 Develop a composition detailing an opinion
- 9.3.5 Organize the ideas and details of a composition according to purpose
- 9.3.8 Use supporting details
- 9.3.11 Arrange paragraphs in a logical progression
- 9.3.12 Use technology to present written work
- 10.3.2 Defend a personal opinion using facts as support
- 10.3.4 Organize the ideas and details of a composition according to purpose
- 10.3.7 Use a variety of supporting details
- 10.3.10 Use a specific point of view in compositions

### English Language Arts (cont.)

- 11.3.2 Organize the ideas and details of a composition according to purpose
- 11.3.3 Elaborate ideas through word choice and description using grade-level vocabulary
- 11.3.5 Use a variety of supporting details
- 11.3.8 Incorporate visual aids into written work to enhance meaning
- 12.3.4 Use variety of sources for supporting details
- 12.3.5 Elaborate ideas through word choice and description using grade-level vocabulary
- 9.6.3 Use conventions of punctuation

Standard 3: PRODUCT GRADING PROCESSES – Understand the grading process of different agricultural products.

## Academic Cross Walk

### Library/Technology Literacy

- 12.1.1 Define a research problem or task
- 12.1.4 Use a variety of criteria to evaluate and select information for research
- 12.1.5 Use organizational strategies to record and synthesize information
- 12.1.6 Present research
- 12.1.7 Evaluate the research process
- 12.4.1 Work cooperatively and collaboratively when using media and technology
- 12.4.2 Develop competence and selectivity in reading, listening, and viewing
- 12.4.3 Demonstrate self-motivation in seeking information
- 12.5.1 Follow school policies for responsible use of information resources
- 12.5.2 Demonstrate proper form of citations and bibliographies
- 12.5.3 Understand and obey intellectual property laws, including copyright, when using information in any format
- 12.5.4 Understand the impact of equitable access to information in a democracy

### Mathematics

- 9-10.1.1 Express numbers between one-billionth and one billion in fraction, decimal, and verbal form; express numbers of all magnitudes in scientific notation
- 9-10.1.8 Apply estimation skills to predict realistic solutions to problems
- 9-10.1.9 Select and use a computational technique to solve problems involving real numbers
- 9-10.1.10 Explain the reasonableness of a problem's solution and the process used to obtain it
- 11-12.1.7 Add, subtract, and multiply complex numbers
- 9-10.3.1 Construct appropriate displays of given data
- 9-10.3.2 Interpret a given visual representation of a set of data
- 9-10.3.6 Calculate probabilities of compound events using addition and multiplication rules
- 11-12.3.1 Choose, construct, and interpret a display to represent a set of data
- 9-10.4.1 Select appropriate units and scales for problem situations involving measurement
- 9-10.4.3 Use approximations to compare the standard and metric systems of measurement
- 9-10.4.4 Given a conversion factor, convert between standard and metric measurements
- 9-10.4.5 Use methods necessary to achieve a specified degree of precision and accuracy in measurement situations
- 9-10.4.6 Employ estimation techniques to evaluate reasonableness of results in measurement situations
- 9-10.5.4 Perform the operations of addition, subtraction, multiplication, and division on algebraic functions
- 9-10.5.10 Solve a literal equation for a specified variable
- 9-10.5.11 Use essential quantitative relationships in a situation to determine whether the relationship can be modeled by a linear function
- 9-10.5.14 Draw conclusions about a situation being modeled

Standard 3: PRODUCT GRADING PROCESSES – Understand the grading process of different agricultural products.

## Academic Cross Walk

### Science

- 9-10.1.1 Understand the interaction of components within a system
- 9-10.1.4 Know how classification can be based on the relationship between form and function
- 9-10.1.6 Explain how models can be used to illustrate scientific principles
- 11-12.1.4 Know how classification can be based on the relationship between form and function
- 9-10.2.1 Use appropriate safety equipment and precautions during investigations
- 9-10.2.5 Use technology and mathematics to improve investigations and communications
- 11-12.2.1 Use appropriate safety equipment and precautions during investigations
- 11-12.2.2 Select and use appropriate instruments, measuring tools, and units of measure to improve scientific investigations
- 11-12.2.5 Use technology and mathematics to improve investigations and communications
- 11-12.2.7 Design and conduct an independent investigation

